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## HAWAIIAN SPECIES OF ENDODONTA AND OPEAS.

BY H. A. PILSBRY AND E. G. VANATTA.

Some five species of the typical group of Endodonts have been described from these islands. One of these, *E. binaria* (Pfr.), is unlike the others in wanting palatal teeth. Two, *E. laminata* (Pse.) and *E. apiculata* Anc., are roughly sculptured, and two, *E. lamellosa* (Fér.) and *E. fricki* (Pfr.), are smoothish, marked with weak growth-lines only. The present paper deals with the smooth species. According to Mr. Thaanum, these snails are found among dead leaves on the ground, never on logs or stumps. The round-whorled, ribbed Endodonts, such as *E. luctifera* and *E. thaanumi*, live on dead stumps and logs, and under the bark of dead trees, but also among fallen leaves. *E. lanaiensis* was found at Mapulehu, Molokai, under bark and on stumps.

**Endodonta lamellosa** (Fér.). Pl. XLIII, figs. 7, 8.

*Helix lamellosa* Fér., Histoire, etc., I, p. 369, Pl. 51A, fig. 3.

The locality of the original specimens of this species is not known. Specimens labelled Kauai in the collection of the Academy agree best with the original figures, one of these being illustrated on our plate. This shell measures, alt. 3.5, diam. 9.5 mm., and has 6½ whorls. The umbilicus is rounded at the bottom, being at first thimble-shaped with subvertical walls; then the suture diverges more, leaving a narrow, flat spiral terrace which descends about 1 to 1¾ turns, the side wall remaining vertical except on the last half whorl where it slopes outward a little, as shown in fig. 8. The keel does not project at the suture on the upper surface, though visible there. The upper parietal lamella is distinctly bifid.

Somewhat smaller shells have been examined from Waianae, Oahu (D. D. Baldwin), and a small race also occurs at Mt. Lihau, near Lahaina, West Maui (D. Thaanum).

Mr. Sykes has placed *E. fricki* (Pfr.) under *E. lamellosa* as a synonym, but without stating that he had seen the type. As originally described and figured, it differs from *lamellosa* by the absence of a columellar lamella. This is, next to the parietal, the most constant of the laminæ in *Endodonta*, and its absence, if confirmed by other specimens and not pathologic, would seem to be of some significance. We have not seen specimens.

**Endodonta marsupialis** n. sp. Pl. XLIII, figs. 1, 2.

Shell lenticular; nearly smooth; light horn colored profusely maculated with reddish brown; spire elevated, convexly conoid; whorls 6½ nearly flat, overhanging a little at the suture; periphery acutely keeled; base convex, with a shallow depression near the peripheral keel; the umbilicus is about one-fifth the diameter of the shell, angular at the edge; the whorls within the umbilicus concave, the side walls sloping inward, and hence the cavity is wider within than at the opening, where the whorl projects in a sort of cord.

Aperture oblique, trapezoidal, provided with two spirally entering parietal lamellæ, the outer one largest and bifid, one columellar lamella, four basal plicæ and one palatal plica.

Alt. 4, diam. 8 mm.

Oahu. Types in the collection of the Academy of Natural Sciences No. 58,190, presented by Mr. J. S. Phillips.

Some specimens have an extra smaller basal and palatal plica near the peripheral angle and some are albinos, corneous yellow, without dark markings.

This species may be distinguished from *E. lamellosa* (Fér.) by its smaller umbilicus and higher spire; from *E. kamehameha* by its greater size, larger teeth and elevated spire. It is distinguished from *E. concentrata* by the greater size and more numerous teeth. It differs from all the other forms by its cavern-like umbilicus, in which the eggs are deposited.

This snail represents a line of differentiation parallel to the section *Libera* Garrett, in the structure of the umbilicus.

**Endodonta kamehameha** n. sp. Pl. XLIII, figs. 3, 4.

Shell lenticular; nearly smooth; yellowish olive, often with the last whorl partly brown, with some traces of darker brown maculation on the spire. Spire moderately depressed, composed of 5½ flat whorls; suture linear; periphery acutely keeled; base conical, slightly impressed near the periphery. Umbilicus about one-third the diameter of the shell, wide and rounded at the bottom, thimble-like with subvertical walls at first, then becoming perspective, terraced, a narrow ledge running down about 1½ whorls, the side walls remaining vertical, only sloping outward a little at the last half whorl. Aperture oblique, trapezoidal, furnished with two spirally entering parietal lamellæ, one columellar lamella, three basal plicæ and one palatal plica, all of which are much weaker than in *E. lamellosa* (Fér.).

Alt. 2.75, diam. 6 mm.

Locality: Wailau Pali, Mapulehu, Molokai. The types are in the collection of the Academy of Natural Sciences, No. 90,140, presented by Mr. D. Thaanum.

This species has a proportionately larger umbilicus than *E. lamellosa* (Fér.) or *concentrata* P. and V., and the teeth are much smaller than in either. The umbilicus resembles that of *E. lamellosa.* It is utilized as a receptacle for the eggs.

**Endodonta concentrata** n. sp. Pl. XLIII, figs. 5, 6.

Shell lenticular; nearly smooth; marked with weak growth-lines only; oliveaceous yellow becoming brown near the lip where the epidermis is preserved, but usually in large part denuded of cuticle, grayish, with irregular angular brown spots on the upper surface of the last whorl, and often some marking on the base; spire convex, composed of 5½ nearly flat whorls, separated by a linear suture. The last half whorl a little descending, the preceding keel a little overhanging, periphery sharply keeled; base convex; umbilicus about one-fifth the diameter of the shell, well-shaped, a little contracted and rounded at the edge, being perceptibly more ample within. Aperture trapezoidal, obstructed by two parietal lamellæ, the outer being the larger and bifid; one columellar lamella; three basal plicæ and one palatal plica.

Alt. 2.75; diam. 5 mm.

Locality: Lanai. The types are in the collection of the Academy of Natural Sciences of Philadelphia, No. 89,241, presented by Mr. D. Thaanum. This *Endodonta* is smaller than *E. lamellosa* (Fér.) and *marsupialis* P. and V. It has the opening of the umbilicus contracted as in *marsupialis* but to a less degree, and neither sharp-edged nor provided with a spiral cord. As in *E. marsupialis*, the eggs are carried in the umbilicus. The apertural laminæ are well developed, much larger than in *E. kamehameha* P. and V.

**Opeas opella** n. sp. Fig. 1.

Shell cream colored, glossy, indistinctly irregularly striate, rather stout, apex obtuse, whorls six moderately convex, body whorl high, umbilicus very small, aperture ovate more than one-third the height of the shell, outer lip evenly arched, columella sinuous and reflexed over the umbilical perforation.

Alt. 6.8, diam. 2.9 mm.

Locality: Honolulu. This species is a little larger and more slender than *O. brevispira* Pils. and has the aperture more elongate. It is smaller and more openly umbilicate than *O. semperi* Hid. *O. hawaiense* Sykes is rougher and more slender. The types were presented to the Academy of Natural Sciences by Dr. W. H. Rush. Mr. R. C. McGregor also found two of these shells under guava leaves at Hilo, Hawaii, and donated them to the Academy.

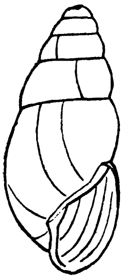
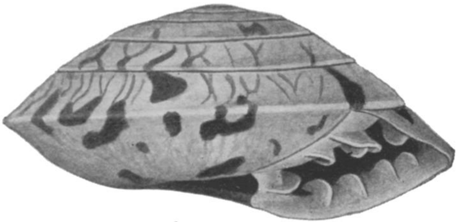


Fig. 1.

*Opeas junceum, hawaiense* and *upolense* are taken, Mr. Thaanum informs us, under stones and bits of board, etc., in gardens and open country. Their occurrence in such places affords no proof that they are native Hawaiians, but, so far as it goes, makes for the view that they are immigrants

## Plate XLIII.

Figs. 1, 2.—*Endodonta marsupialis* n. sp.
Figs. 3, 4.—*Endodonta kamehameha* n. sp.
Figs. 5, 6.—*Endodonta concentrata*, n. sp.
Figs. 7, 8.—*Endodonta lamellosa* Fér. Kauai.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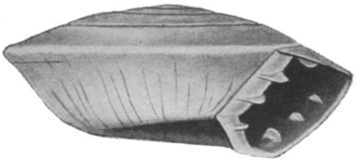
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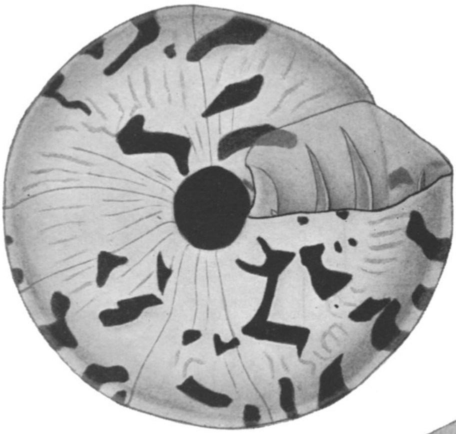
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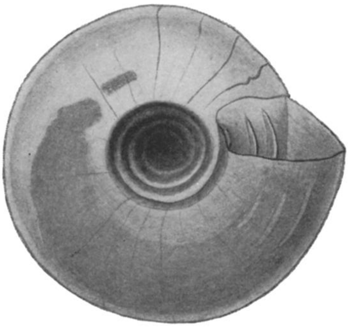
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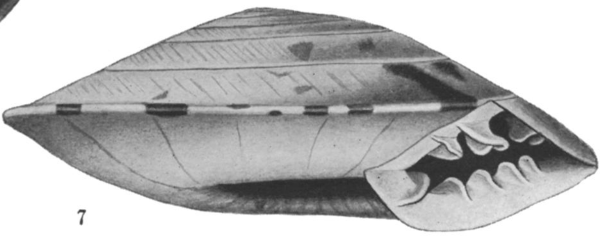
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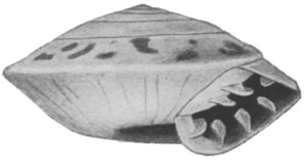
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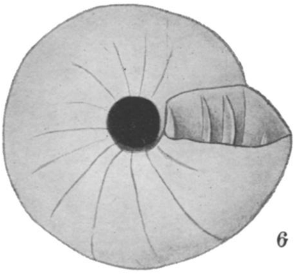
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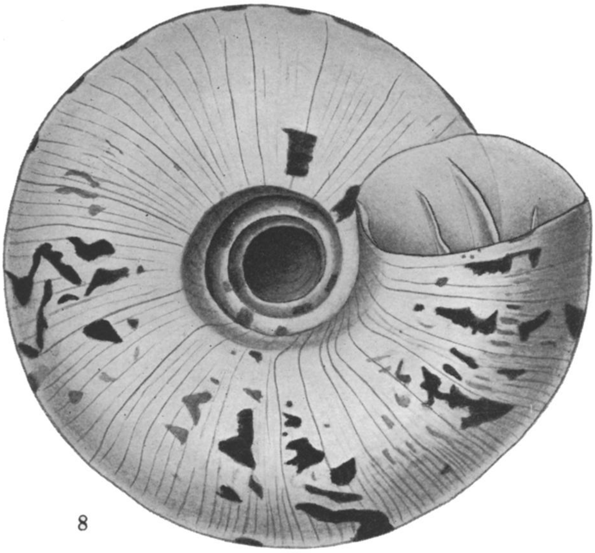
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PILSBRY AND VANATTA. HAWAIIAN ENDODONTA AND OPEAS.